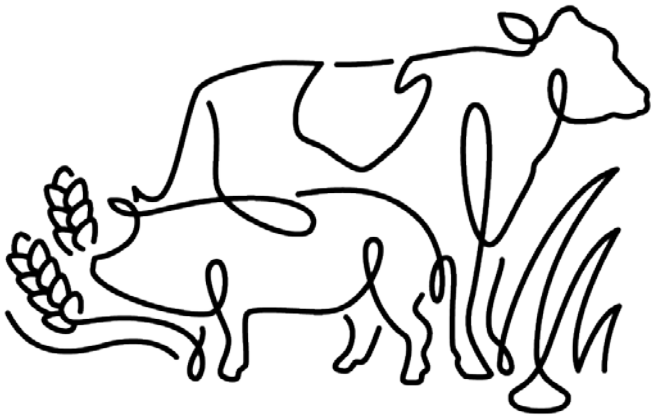

Baltic Slurry Acidification

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Baltic Slurry Acidification

Hushållnings sällskapet

Reducing nitrogen loss from livestock production by promoting the use of slurry acidification techniques in the Baltic Sea Region

Background

- Livestock manure is the main source of ammonia-nitrogen emissions in the Baltic Sea Region
- Ammonia losses can be reduced with slurry acidification techniques (SATs)
- The project aims to promote the implementation of these techniques in the region

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Baltic Slurry Acidification

Slurry Acidification Techniques

The three main types of SATs:

- In-house acidification of livestock slurry
- In-storage acidification of stored livestock slurry
- In-field acidification of livestock slurry during field spreading

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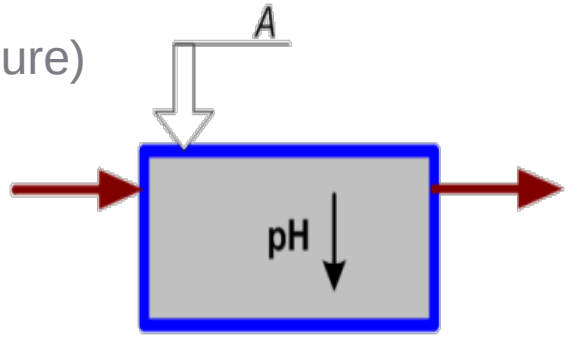
Baltic Slurry Acidification

Basic principle of slurry acidification

- Acid (A) is added to the liquid manure stream, whereby pH is lowered
- The commonly used acid is concentrated (98% pure) sulfuric acid – H_2SO_4:
  - Cheap – costs about 0.38/0.2 € per litre/kg
  - Available
  - One of the most important plant fertilisers
  - Is in fact a raw material for making a range of mineral fertilisers, such as phosphate fertilisers via phosphoric acid, and ammonium sulphate



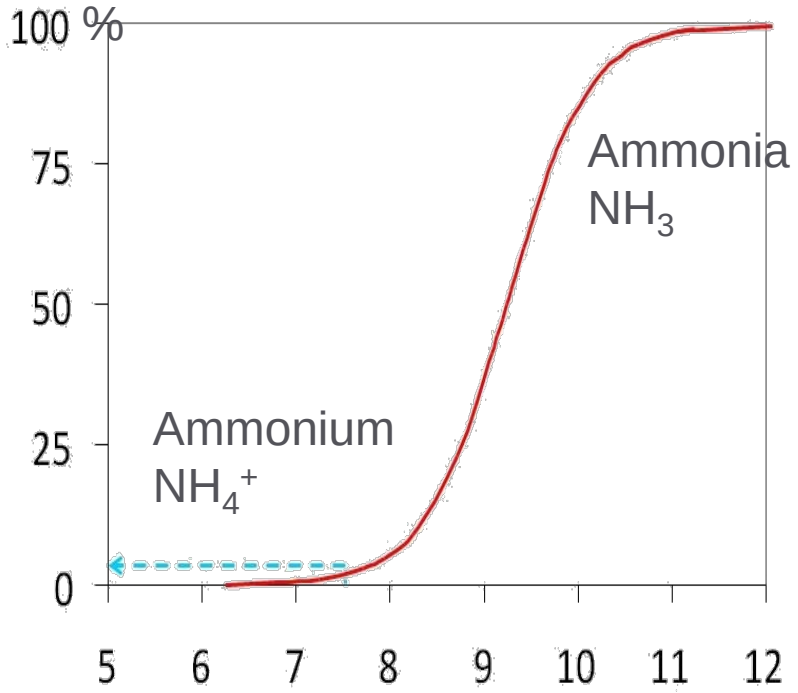

SyreN

Simple chemical trick with huge effect!

- One of the buffer systems in slurry/liquid manure is the equilibrium between ammonium salt and ammonia gas:

$$NH_4^+ + OH^- \leftrightarrow NH_3 + H_2O$$

- At pH 6.4, all mineralised N is found as ammonium, and no evaporation takes place.



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Baltic Slurry Acidification

Effects of slurry acidification – acid consumption

- Crops' needs for Sulphur is e.g. in the range of 20 kg per ha for winter wheat and 50 kg per ha for winter rape seed.
- Sulphuric acid contains around 1/3 sulphur, meaning e.g. 20 ton slurry with 3 kg sulphuric acid per ton (1,6 litres per ton) would give the crop about 20 kg S per ha, which is app. sufficient for winter wheat.

- Under many circumstance, the sulphuric acid consumption fits the needs of the crop, and the costs for sulphuric acid is directly saved on the purchase of S fertiliser.

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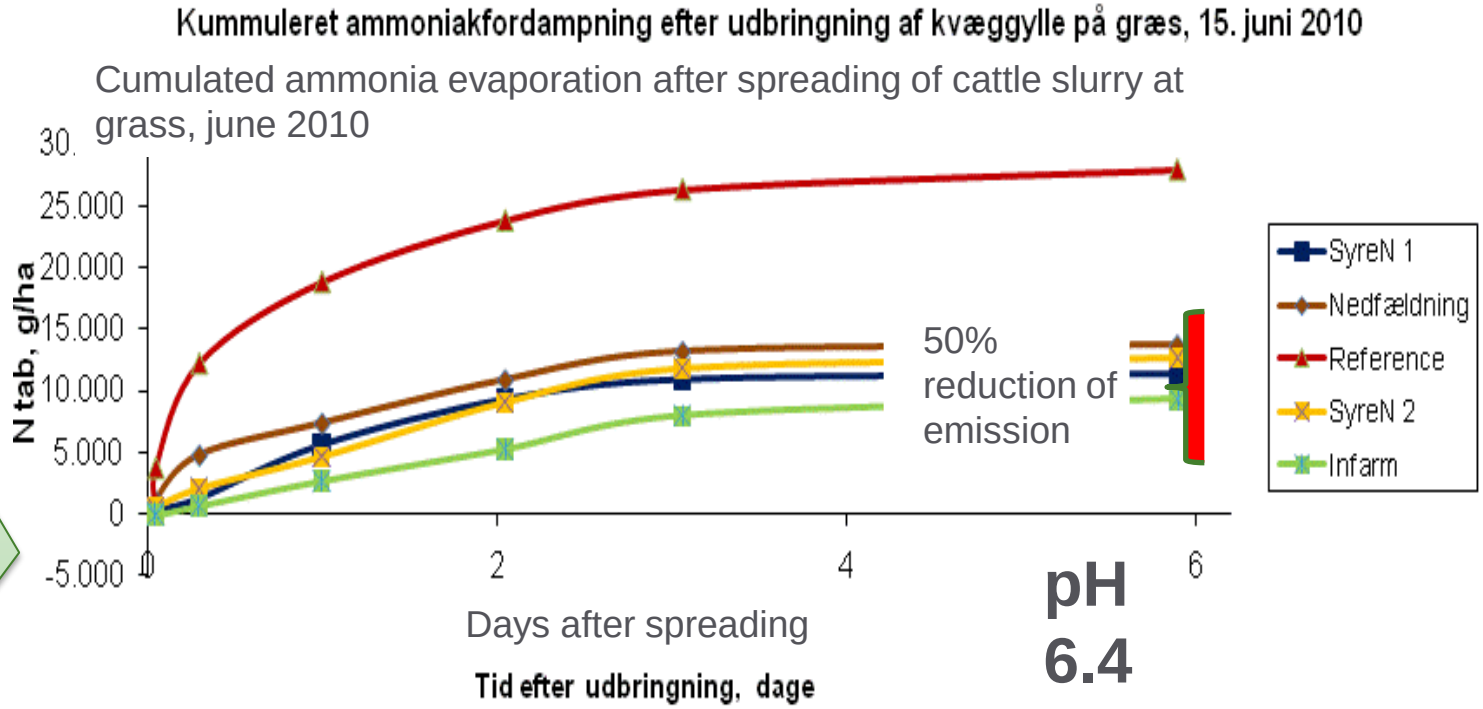
Effects of slurry acidification – yield effect

The yield effect is most due to the higher N fertilising effect of acidificed slurry



Source: Tavs Nyord, Aarhus University

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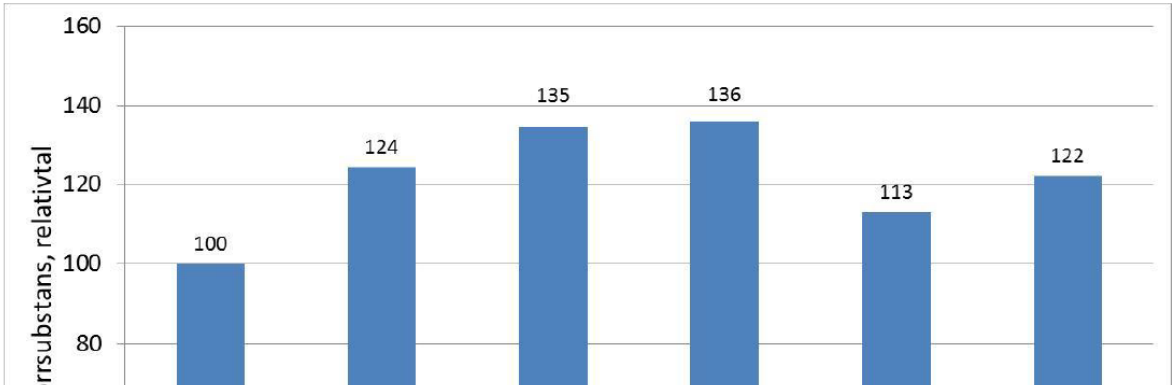
Baltic Slurry Acidification

Gödslingsförsök vall andra skörd



Tabell 1. Försöksplan

Treatments		Spring (first cut)		Regrowth (second cut)		Total nutrient supply, kg/ha			
		Nutrient supply	N-rate, kg/ha	Nutrient supply	N-rate, kg/ha	N	P	K	S
A	Control	NPK 21-3-10 (including 4S)	80	-	0	80	10	37	14
B	Mineral fertilizer			NPK 21-3-10 (including 4S)	30	110	14	51	20
C					60	140	18	65	25
D					90	170	21	79	31
E	Untreated slurry			25 tonnes/ha	60	140	29	217	29
F	Acidified slurry								58

Är försurning en teknik för dig?
Vill du veta mer?

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